**Pressure Activity #1**

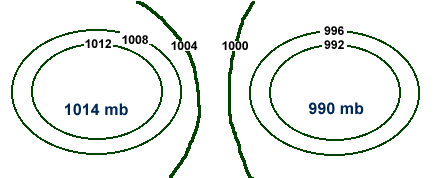
**Introduction:**

Though you may not realize it, the air has weight. All the air molecules in the atmosphere exert a force, or pressure, on our bodies. Atmospheric pressure is the force exerted by the weight of the air above an object or surface. Variations in pressure generate winds, which play a significant role in day to day weather conditions. This activity introduces characteristics of pressure, high and low pressure centers, and allows brief analysis of an idealized pressure field.

**Characteristics of Pressure:**

1. What are the different units of air pressure? Which unit is used most by meteorologists for air pressure?
2. Circle the correct response in the following sentence: Pressure (increases / decreases) with altitude (height above sea level). Please explain why pressure changes this way with altitude.

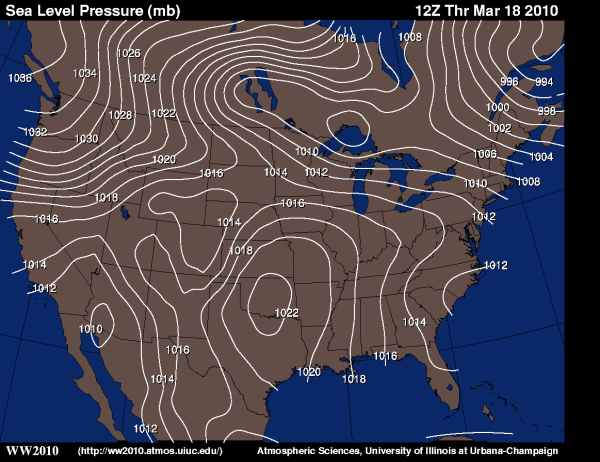
**Analysis of a Pressure Field:**   
**3)** The diagram below is an idealized pressure field resembling those commonly found on surface weather maps. Recall from our study of topography, that maps which show curved lines are called contour maps. The contour lines connect locations with similar values of whatever property the map is giving information about such as surface elevation above sea level (topographic map), temperature (isotherm map) or in this case pressure (isobar map). The numbers along each contour (line) indicate the pressure value in millibars (mb) for that particular contour.



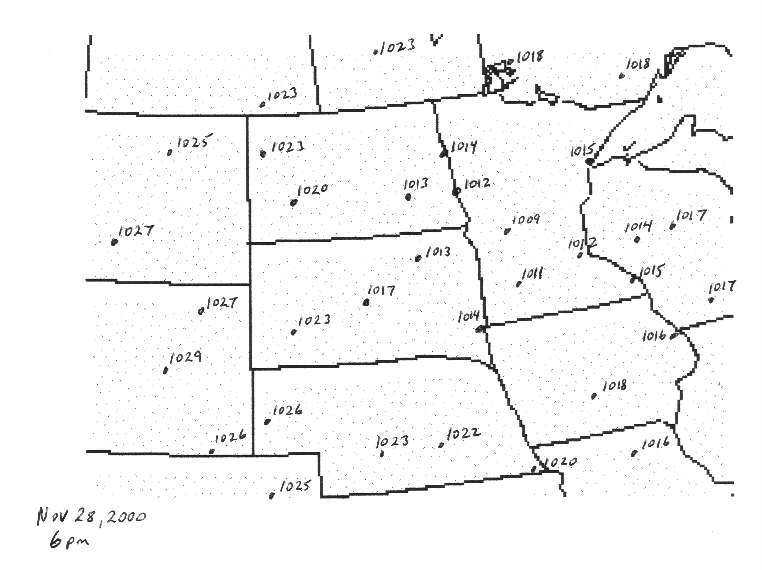
* Recall from the textbook reading (chapter 19.1) how air moves between two different pressure centers. Air flows only in one direction according to pressure gradients. Draw an arrow on the diagram above indicating the direction in which the pressure gradient force is pointing, and thus which way air would move.

**Examine the Isobar Map below:**

1. Using what you know about pressure gradients and wind… label the windiest areas with a **W** then use a **C** to label areas with calm winds.



**DRAWING ISOBARS ON A WEATHER MAP**

1. Try to figure out the isobars for the map below with data from Nov 28, 2000, when 5-11 inches of snow fell in the Fargo-Moorhead area due to a low pressure center southeast of town. Drawing the isobars should reveal the location of the low-pressure center as well as regions of higher pressure. Label your isobars as 1000mb, 1004mb, 1008mb, 1012mb, 1016mb, 1020mb, and 1024mb (4mb isobaric interval). Draw an **L** in the center of low pressure an **H** in the center of high pressure.

**How can drawing isobars and isotherms be useful in the real world?**

Drawing isobars (lines of equal pressure) enable the identification of locations of high and low pressure. Also, areas where there are steep pressure gradients (resulting in high wind speeds) can be located. This information is obviously useful to meteorologists for the purpose of forecasting cloud cover, wind speed, etc.

On the map below draw isobars for **1016mb, 1020mb, and 1024mb.** Does this map show a high pressure or low pressure system?

